

WHAT IS CLAIMED IS:

1. A nonlinear characteristic coil spring used in a primary spring of a truck for a railway vehicle comprising:

a tapered portion having a spring wire diameter that gradually decreases as it is closer to an end portion of a spring wire.
2. The nonlinear characteristic coil spring according to Claim 1, further comprising a constant-diameter portion having a constant spring wire diameter, wherein the tapered portion is formed continuously on each of both ends of the constant-diameter portion.
3. A radius arm type truck comprising:

a base frame;

an axle box for supporting an axle;

a radius arm rotatably supported by the base frame at one end thereof and connected to the axle box at an opposite end thereof; and

a coil spring provided as a primary spring between an upper portion of the axle box and the base frame;

wherein the coil spring is formed by a nonlinear characteristic spring having a tapered portion having a spring wire diameter that gradually decreases as it is closer to an end portion of a spring wire.

4. The radius arm type truck according to Claim 3, further comprising:
a lower spring seat provided on the upper portion of the axle box with a first elastic member disposed between the lower spring seat and the axle box; and
an upper spring seat provided on the base frame with a second elastic member disposed between the upper spring seat and the base frame, wherein
the coil spring is mounted between the upper spring seat and the lower spring seat.
5. The radius arm type truck according to Claim 3, wherein the coil spring has a constant-diameter portion having a constant wire diameter, and the tapered portion is formed continuously on each of both ends of the constant-diameter portion.
6. The radius arm type truck according to Claim 3, wherein the truck is constructed to run along a railroad provided with a third rail for power supply arranged in parallel with a rail for running, and
a current collector that comes in elastic contact with the third rail is attached to the base frame.